

## ORIGINAL RESEARCH

# Is Dental Treatment Safe in Pregnancy? A Dentist's Opinion Survey in South India

Guntipalli M Naidu, K Chaitanya Ram, Raj Kumar Chowdary Kopuri, S Eswar Prasad, Durga Prasad, Suresh Babburi

## ABSTRACT

**Background:** Oral health of pregnant patients is considered as an essential component of the overall health of the mother and the developing fetus. The aim of this study was to know dentist perspective regarding treatment options in pregnant patients.

**Materials and methods:** A cross-sectional survey was conducted among dentists of south India by mailing a self-administered questionnaire to collect data on management choices of the pregnant dental patient related to treatment practices and therapeutic choices of dentists and also their sociodemographic and practice characteristics.

**Results:** A total of 726 questionnaires was collected. Around 28.5% of the participants took radiographs for pregnant patients. Mostly, all the surveyed dentists would extract a non-restorable painful tooth during pregnancy. Around 89.3% prescribe a mouthwash and 37% would perform root planning and periodontal surgery for gingival bleeding and calculus deposits. Majority of the dentists (92.9%) prescribe amoxicillin. By far paracetamol was the most popular analgesic agent (91%). The majority of the dentists (62.3%) would use plain xylocaine.

**Conclusion:** There is a clear lack of knowledge about the appropriate management of the pregnant dental patient among the surveyed dentists regardless of their sociodemographic and practice characteristics necessitating continuous education on the dental management of pregnant dental patient.

**Keywords:** Dentist opinion, Treatment options, Oral health, Pregnancy.

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## INTRODUCTION

Pregnancy results in physiologic changes in almost all organ systems in the body and in systemic disorders.

*Hemodynamic alterations:* elevation of the coagulation factors V, VII, VIII, X and XII, and reduction of the factors XI and XIII, with an increased fibrinolytic activity to compensate for the increased clotting tendency.

*Gastrointestinal alterations:* increased intragastric pressure, reduction in the lower esophageal sphincter tone which is secondary to inhibition of the production of the motility peptide hormone due to the rise in progesterone concentrations are observed in this period. These alterations in turn give rise to (acidity) in 30 to 70% of all the pregnant women.<sup>1,2</sup> Nausea and vomiting are experienced by 66% of all the pregnant women.

*Endocrine alterations:* Gestational diabetes is observed in 45% of all the pregnant women.<sup>3</sup>

*Oral alterations:* Pregnancy gingivitis is a clinically proven manifestation during pregnancy.<sup>4</sup> The oral changes seen are gingivitis, gingival hyperplasia, pyogenic granuloma and salivary changes. Rise in the levels of circulating estrogen, cause an increase in the capillary permeability and predispose the pregnant women to gingivitis and gingival hyperplasia.<sup>5</sup> Even though pregnancy does not cause periodontitis, it worsens the condition.<sup>6</sup>

Pyogenic granulomas (pregnancy tumors) are seen on the labial aspect of the interdental papilla. It occurs in about 1 to 5% of the pregnant women. Increased angiogenesis caused by sex hormones, coupled with gingival irritation due to local factors, such as plaque, is believed to cause pyogenic granuloma.<sup>7</sup> There is no predilection in relation to the trimester involved. Tooth mobility seen may be a result of the changes occurring in the attachment apparatus. The problem typically resolves postpartum.<sup>8</sup> Increased gonadotropins in the first trimester are associated with vomiting. The gastric acids, which are present in the emesis, lead to erosion of enamel.<sup>9</sup> The main salivary changes involve its flow, composition, pH and hormone levels. The changes in the composition of the saliva include a decrease in the sodium concentration and pH, and an increase in the potassium, protein and the oestrogen levels. Checking the salivary estrogen level has been suggested as a screening test to detect the risk potential for a preterm labor.<sup>10-12</sup> Studies have shown that an unhealthy mouth can cause problems, such as preeclampsia (a dangerous hypertensive condition that affects mother and fetus) and premature low-weight birth.<sup>12-14</sup>

Dentists are reluctant to provide dental care to pregnant patients due to uncertainty over the risks that might be imposed on both the mother and the fetus. This uncertainty is reflected as an under care for this vulnerable population. There are only few studies stating dentists' opinion toward dental care for pregnant patients.<sup>15,16</sup> Hence, an attempt has been made to do an e-mail survey on dentists of South India regarding their perspective on dental care options for pregnant patients.

## MATERIALS AND METHODS

A list of dentists along with mailing addresses was collected from state dental council registries of south India.

A self-administered questionnaire was emailed to dentists working in group, private practices, dental clinics/hospitals and government/private institutes in four states of south India. It took around 4 months to collect the data. A total of 1140 questionnaires was mailed, out of which 726 complete filled form were taken for analysis. Incomplete forms and unreturned forms were discarded from study. Ethical clearance was obtained from the ethical committee of the institution.

### Survey Instrument

Data was generated through a questionnaire that was designed in English language and which comprised a series of questions pertaining to sociodemographic and practice characteristics in addition to management choices of the pregnant dental patient. The demographic and practice portion of the instrument included questions on gender, specialty, place of degree, number of years in clinical practice and type of practice.

Questions pertaining to management choices of the pregnant dental patient were close-ended responses. Sections covered different aspects of dental treatment practices for the pregnant patient, such as tooth extraction, dental X-ray examination and periodontal treatment. Additionally, selected therapeutic choices, such as antibiotics, analgesics and local anesthesia, for the pregnant patient were also

included. The survey results were analyzed for all the sociodemographic data and practice management choices; however, only the statistically significant results are reported here.

### STATISTICAL ANALYSIS

The data analysis was performed by means of SPSS program version 17.0 and the frequency distributions were computed. The chi-square test was used to detect differences between the study subjects considering the sociodemographic data and practice management choices. The p-value was set at  $<0.05$  for significance throughout the study.

### RESULTS

The response rate of e-mail survey was 64% (Table 1). Out of the 726 surveyed, 57% were males and 43% were females with mean age of  $37.5 \pm 2.1$ . The majority of respondents were general dental practitioners with BDS (Bachelor of Dental Sciences) degree (67%). Most of the responses were from Karnataka (47%) followed by Andhra Pradesh (24%). The least response came from state of Kerala (13%). The participants were grouped into two categories based on their clinical experience. Around 38.4% had 5 years or more of clinical experience and 61.5% had less than 5 years. Two thirds of the participants (65%) work in government and private practices and 35% were working in private dental institutions.

Around 28.5% of the entire study population said that they would take a radiograph if necessary while 71.5% felt otherwise even if they are uncertain of the diagnosis (Table 2). Females participants are more conscious about X-ray exposure than males which is statistically significant ( $p = 0.009$ ). 87.5% of the dentists prefer doing only simple restorations. Ninety seven percent of the dentists were of the opinion that they would extract a non-restorable painful tooth.

In response to oral hygiene measures prescribed, all the participants were in favor of giving oral hygiene instructions. While 89.3% would prescribe a mouthwash, 95% preferred scaling, but 37% suggested root planning or periodontal surgery for a pregnant patient. Most of the female subjects avoid root planning and periodontal surgery during pregnancy than males which is statistically significant ( $p = 0.002$ ).

MDS study subjects are more particular about less X-ray exposure than BDS study subjects which is statistically significant ( $p = 0.004$ ) (Table 3). Rest other practice management options for BDS study subjects and MDS study subjects were similar except root planning and periodontal surgery which is statistically significant ( $p = 0.001$ ).

**Table 1:** Distribution based on gender, type of practice, type of degree, state, clinical experience

Sex	Number	Percentage
Female	313	43
Male	413	57
Total	726	100
<i>Type of practice</i>		
Private specialty practice	109	15
Private general practice	327	45
Private dental institutes	145	20
Govt. dental practice	36	5
Govt. dental institutes	109	15
Total	726	100
<i>Type of degree</i>		
BDS	240	67
MDS	486	33
Total	726	100
<i>State</i>		
Andhra Pradesh	174	24
Karnataka	341	47
Kerala	95	13
Tamil Nadu	116	16
Total	726	100
<i>Clinical experience</i>		
Five years or more	279	38.4
Less than 5 years	447	61.5
Total	726	100

**Table 2: Association between gender and practice management options**

Responses	Male	%	Female	%	Total	%	Chi-square	p-value
<i>X-rays in pregnant patients</i>								
Yes	140	33.9	67	21.4	207	28.5	18.72	0.009*
No	273	66.1	246	78.6	519	71.5		
Total	413	100	313	100	726	100		
<i>Simple restorations</i>								
Yes	395	95.6	290	76.7	635	87.4	3.26	0.350
No	18	4.4	73	23.3	91	12.6		
Total	413	100	313	100	726	100		
<i>Extraction of non-restorable tooth</i>								
Yes	398	96.4	306	97.8	704	97	3.91	0.480
No	15	3.6	7	2.2	22	3		
Total	413	100	313	100	726	100		
<i>Oral hygiene instructions</i>								
Yes	413	100	313	100	726	100	5.71	0.206
No	0	0	0	0	0	0		
Total	413	100	313	100	726	100		
<i>Advice mouth-washes</i>								
Yes	347	84	301	96	648	89.3	5.86	0.208
No	66	16	12	4	78	10.9		
Total	413	100	313	100	726	100		
<i>Complete oral prophylaxis</i>								
Yes	402	97.3	288	92	690	95	8.12	0.072
No	11	2.7	25	8	36	5		
Total	413	100	313	100	726	100		
<i>Root planning and periodontal surgery</i>								
Yes	218	53	51	16.3	269	37	24.06	0.002*
No	195	47	262	83.7	457	63		
Total	413	100	313	100	726	100		

\*p &lt; 0.001

Practice management options for study subjects who are practicing since more than 5 years (Table 4) and less than 5 years are similar except X-ray exposure ( $p = 0.005$ ), simple restoration ( $p = 0.042$ ), root planning and periodontal surgery ( $p = 0.005$ ) which is statistical significant. Clinical experiences of more than 5 years are more conscious about their practice management options.

Four antibiotic choices were surveyed which included amoxicillin, clindamycin, metronidazole and cephalosporines (Table 5). The majority of the dentists (92.9%) prescribed amoxicillin to a pregnant patient. While 2.5% would prescribe clindamycin to a pregnant patient only 3.2% dentists would prescribe cephalosporin. 1.4% dentists would prescribe metronidazole to a pregnant patient.

Four analgesic agents were surveyed. The analgesics taken into consideration were paracetamol, Ibuprofen, aspirin and codeine. By far, paracetamol was the most

popular analgesic agent (91%) and only 9% of the dentists suggested ibuprofen.

In response to the choice of local anesthesia, majority of the dentists choose to use plain xylocaine (62.3%) and 37.7% of the dentists choose to use xylocaine with adrenaline (Table 6).

## DISCUSSION

This study showed that 28.5% of surveyed dentists would take a radiograph only if necessary for a definitive diagnosis of a pregnant patient complaint. However, a European study showed a higher response rate of 33% who would request a radiographic examination when necessary.<sup>15</sup> The concept of avoiding radiographs during pregnancy generally applies to procedures in which the embryo or fetus would be in or near the primary beam. For dental radiography, the primary beam is limited to the head and neck region. Use

**Table 3:** Association between type of degree and practice management options

Responses	BDS	%	MDS	%	Total	%	Chi-square	p-value
<i>X-rays in pregnant patients</i>								
Yes	172	71	35	7.2	207	28.5	15.921	0.004*
No	68	29	451	92.8	519	71.5		
Total	240	100	486	100	726	100		
<i>Simple restorations</i>								
Yes	209	87	426	87.6	635	87.4	6.831	0.865
No	31	13	60	12.4	91	12.6		
Total	240	100	486	100	726	100		
<i>Extraction of nonrestorable tooth</i>								
Yes	233	97	471	96.9	704	97	14.550	0.104
No	7	3	15	3.1	22	3		
Total	240	100	486	100	726	100		
<i>Oral hygiene instructions</i>								
Yes	240	100	486	100	726	100	16.360	0.154
No	0	0	0	0	0	0		
Total	240	100	486	100	726	100		
<i>Advice mouth washes</i>								
Yes	210	87.5	438	90.1	648	89.3	8.763	0.089
No	30	12.5	48	9.9	78	10.9		
Total	240	100	486	100	726	100		
<i>Complete oral prophylaxis</i>								
Yes	224	93.3	466	95.9	690	95	11.393	0.402
No	16	6.7	20	4.1	36	5		
Total	240	100	486	100	726	100		
<i>Root planning and periodontal surgery</i>								
yes	23	9.6	246	50.6	269	37	32.523	0.001*
No	217	90.4	240	49.4	457	63		
Total	240	100	486	100	726	100		

\*p &lt; 0.001

of high-speed film, filtration, collimation and leaded aprons, greatly reduce exposure. A full-mouth radiographic series have been shown to be significantly less than 1 cGy, a dose far lower than uterine exposure from naturally occurring background radiation during the 9 months of pregnancy.<sup>17-19</sup> The maximum risk attributable to 1 cGy exposure to the fetus has been estimated to be about 0.1%, a quantity thousands of times less than the baseline risks of spontaneous abortion, malformation or genetic disease.<sup>19,20</sup> It is prudent to avoid or minimize the use of diagnostic radiography during pregnancy, especially during the first trimester, the period of organogenesis.<sup>17,21-23</sup>

Minor/outpatient oral and maxillofacial surgical procedures can be done for pregnant patients if some basic guidelines are followed. Most of the dentists in this survey would extract a painful non-restorable tooth during pregnancy. Elective dental care is best deferred until after

parturition.<sup>24,25</sup> Initiating or continuing an oral health preventive care program is essential during pregnancy, however, 7.7% of the participants either would not perform scaling or were uncertain about it. This over conservative choice is inappropriate and reflects lack of knowledge among this group.

Vast Literature exists explaining the therapeutic choices a clinician should make and the safety dosages for a pregnant and a lactating woman.<sup>26-30</sup> In the present survey, however, uncertain answer were noticed in therapeutic choices section than in management choices section. 84.6% would prescribe amoxicillin and only 5.1% on average would prescribe clindamycin, metronidazole and cephalosporines. This is most likely due to the lack of knowledge about their safety. Clinicians should always strive to choose medications which would not cross the placental barrier and hitherto affect the mother and the fetus.

**Table 4: Association between clinical experience and practice management options**

Responses	<5 years	%	>5 years	%	Total	%	Chi-square	p-value
<i>X-rays in pregnant patients</i>								
Yes	190	42.5	17	6.1	207	28.5	26.051	0.005*
No	257	57.5	262	93.9	519	71.5		
Total	447	100	279	100	726	100		
<i>Simple restorations</i>								
Yes	437	97.7	198	70.9	635	87.4	21.31	0.042*
No	10	2.3	81	29.1	91	12.6		
Total	447	100	279	100	726	100		
<i>Extraction of nonrestorable tooth</i>								
Yes	434	97.8	270	96.8	704	97	13.906	0.195
No	13	2.2	9	3.2	22	3		
Total	447	100	279	100	726	100		
<i>Oral hygiene instructions</i>								
Yes	447	100	279	100	726	100	7.499	0.858
No	0	0	0	0	0	0		
Total	447	100	279	100	726	100		
<i>Advice mouthwashes</i>								
Yes	380	85	268	96	648	89.3	11.867	0.074
No	67	15	11	4	78	10.7		
Total	447	100	279	100	726	100		
<i>Complete oral prophylaxis</i>								
Yes	419	93.7	271	97.1	690	95	10.575	0.921
No	28	6.3	8	2.9	36	5		
Total	447	100	279	100	726	100		
<i>Root planning and periodontal surgery</i>								
Yes	204	45.6	65	23.3	269	37	28.026	0.005*
No	243	54.4	214	76.7	457	63		
Total	447	100	279	100	726	100		

\*p &lt; 0.001

**Table 5: Antibiotic and analgesic choices of the dentists**

Antibiotic	Dentist choice of antibiotic	
	Number	Percentage
Amoxicillin	674	92.9
Clindamycin	18	2.5
Metronidazole	11	1.4
Cephalosporin	23	3.2
Total	726	100
Analgesic	Dentist choice of analgesic	
	Number	Percentage
Paracetamol	660	91
Ibuprofen	66	9
Aspirin	0	0
Codeine	0	0
Total	726	100

## CONCLUSION

Oral health is of vital importance for a pregnant patient as the effects of a poor oral hygiene may have a profound

**Table 6: Local anesthesia (LA) choices of dentists**

Local anesthetic agent	Dentist choice of LA	
	Number	Percentage
Xylocaine plain	452	62.3
Xylocaine with adrenaline	274	37.7
Prilocaine plain	0	0
Prilocaine with felypressin	0	0
Total	726	100

influence on the systemic health of the mother and the growing fetus. Attention to the physiologic changes associated with pregnancy, knowledge of radiation and its effects, prescribing medications on the basis of drug safety categories and aggressive management of oral infection appropriately are important considerations. Dentists need to play a proactive role in the maintenance of the oral health of pregnant women. This survey showed that there is a clear lack of knowledge about appropriate management of the pregnant dental patient among the surveyed dentists regardless of their



sociodemographic and practice characteristics necessitating continuous education on the dental management of pregnant dental patient.

## RECOMMENDATIONS AND LIMITATIONS

This survey is unique as it was performed all over South India. However, as this was an e-mail based survey, not all the dentists responded to the questionnaire thus leading to the attrition of the sample. This is one of the major limitations of the present study.

The result of the study had clearly elucidated that there is a certain lack of knowledge in the dental treatment of pregnant patients. The authors thus recommend that there should be workshops and continuing dental education programs conducted in relation to this subject and a chapter should be included in the curriculum describing the changes a dentist needs to make in his/her treatment plan in a pharmacological and treatment perspective.

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## ABOUT THE AUTHORS

### Guntipalli M Naidu (Corresponding Author)

Assistant Professor, Department of Public Health Dentistry, Drs Sudha and Nageswara Rao Siddhartha Institute of Dental Sciences Gannavaram 521101, Andhra Pradesh, India, Phone: 9440787232 e-mail: [naiduguntipalli@gmail.com](mailto:naiduguntipalli@gmail.com)

### K Chaitanya Ram

Assistant Professor, Department of Pedodontics and Preventive Dentistry, Drs Sudha and Nageswara Rao Siddhartha Institute of Dental Sciences, Gannavaram, Andhra Pradesh, India

**Raj Kumar Chowdary Kopuri**

Assistant Professor, Department of Pedodontics and Preventive Dentistry, St Joseph College of Dental Sciences, Eluru, Andhra Pradesh, India

**S Eswar Prasad**

Assistant Professor, Department of Orthodontics, Drs Sudha and Nageswara Rao Siddhartha Institute of Dental Sciences, Gannavaram Andhra Pradesh, India

**Durga Prasad**

Assistant Professor, Department of Prosthodontics, Drs Sudha and Nageswara Rao Siddhartha Institute of Dental Sciences, Gannavaram Andhra Pradesh, India

**Suresh Babburi**

Reader, Department of Oral Pathology, Drs Sudha and Nageswara Rao Siddhartha Institute of Dental Sciences, Gannavaram, Andhra Pradesh, India